Acquisition of Temporal Interpretation by Japanese-speaking Learners of English: A Reconsideration of Feature Reassembly Hypothesis

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Abstract

The current paper investigated second language (L2) acquisition of temporal interpretation within the framework of Generative Grammar. The purpose is to examine whether Feature Reassembly Hypothesis (Lardiere 2008, 2009a, b) correctly predicts the learnability problems. Forty-six Japanese-speaking learners of English were tested in an experimental setting. Results from a judgment task revealed that the degree of complexity of feature reassembly did not necessarily determine the difficulty in L2 acquisition of formal features, contra the Feature Reassembly Hypothesis.

I. Introduction

For decades a considerable number of studies have been made on the role of Universal Grammar (UG) in the course of second language (L2) development. There are two positions on whether UG constraints interlanguage grammar, which means non-native speakers' grammar (White 2003). Some researchers argue that interlanguage grammar includes properties which are not permitted by UG (Bley-Vroman 1989, Thomas 1991). Other researchers maintain that interlanguage grammar is fully constrained by UG. Among researchers taking this position, there have been two contrasting views: the Impaired Functional Representation and Full Functional Representation views. The former claims that adult L2 learners are unable to access L2 functional categories and their associated formal features which are not activated in their first language acquisition, resulting in an 'impaired' functional representation (Tsimpli and Roussou 1991, Hawkins and Chan 1997, Tsimpli 2003, Hawkins and Hattori 2006, among others). For instance, Hawkins and Chan (1997) investigated whether Chinese-speaking learners of English were able to acquire target-like knowledge of relative clauses, which are related to [+/- wh] feature. Results of a grammaticality judgement test revealed that they failed to acquire the [+/- wh] feature; instead, they transferred their L1 properties, which make their interlanguage grammar appear

to be target-like. By contrast, the latter view proposes that adult L2 learners are able to fully represent functional categories and formal features in the interlanguage (Schwartz and Sprouse 1994, 1996; Lardiere 1998a, 1998b; Prévost and White 2000; Goad, White and Steele 2003; among others). For instance, Prévost and White (2000) argue that inconsistent suppliance of L2 functional morphology is a reflection of difficulties in the realization of surface morphology, rather than a reflection of impaired functional representation.

Following the Full Functional Representation view, Lardiere (2008, 2009a, b) proposed Feature Reassembly Hypothesis, arguing that rather than selecting features from a universal feature inventory made available by UG, what is problematic for L2 learners is assembling features into new formal configurations. Let us take the acquisition of the [+past] feature by English-speaking learners of Somari as an example. Although [+past] is grammaticalised in both English and Somali, lexical items on which it appears are different. Consider (1)

(1) a. árday-gii hore
student-detM.past before
'the former student'

b. (Weligay) dúhur-kii baan wax cunaa
(always) noon-detM.past F.1S thing eat.present
'I (always) eat at noon.'

c. Inán-tii hálkée bay joogta?
girl-detF.past place-detM.Q F.3S stay.F.present
'Where is the girl?'

d. Búug-gani waa bug-gíi Maryan
book-detM.dem Focus book-detM.past Maryan
'This book is Maryan's book.'

(Lecarme 2003, 2004, cited in Lardiere 2008: 113-114)

In (1a) [+past] realized on the determiner expresses past time agreement. The one in (1b) expresses temporal habitualness, evidentiality in (1c), and possession in genitive constructions in (1d). Learning tasks for the English speakers is to newly associate [+past] with D elements. What is problematic for L2 learners is this sort of complicated tasks, according to Lardiere.

Her proposal is significant in that she draws attention to the feature reassembly. In addition, it seems plausible because the learning tasks illustrated in (1) must be tremendous. However, the proposal may have some flaws. First, it lacks predictive power (White 2009). For instance, we cannot predict which interpretation of the English [+past] feature is the easiest. Lardiere does not try to predict whether all features are equally

hard to re-map to surface morphology, or whether the number of features to re-assemble determines the degree of difficulty. Moreover, as White (2009) argues again, Lardiere has not dealt with learnability problems in acquiring L2 features which are not selected in L1.

The purpose of this article is to provide an explanation for L2 acquisition in relation to the debate introduced above. For this purpose, the Feature Reassembly Hypothesis will be considered; specifically, I will investigate whether we can explain learnability of formal features by looking at the degree of complexity of feature reconfiguration.

The empirical study of this article examined Japanese speakers' knowledge of temporal interpretation in English. The rational for dealing with interpretation rather than production of the surface morphology is that the semantic consequences of (an interaction of) features are a better reflection of the L2 knowledge of abstract syntactic representation than the surface manifestation of features (Hawkins et al. 2008). I assume that investigating interpretation enables us to explore the L2 learners' abstract knowledge more directly than investigating production. Moreover, there have been much fewer studies on interpretation than production of surface inflection among L2 acquisition studies addressing abstract syntactic representations in the domain of tense. Therefore, the present study can be a contribution to an under-researched area.

The rest of the present article is structured as follows. The following section outlines the interpretation of the tense morphemes in English and Japanese, and introduces Stowell's (2007) predicative theory of tense in order to clarify sources of the cross-linguistic differences in the temporal interpretation in complement clauses. An empirical study is reported in Section III, and Section IV offers a discussion about the findings.

II. Temporality in English and Japanese

In this chapter, the tense system of English and Japanese are explained. Both languages grammaticalise tense; specifically, English past events are marked by adding the past tense affix *–ed* to a verb stem, or changing the stem. In Japanese, past events are marked by the verb endings *–ta* while nonpast events are marked by *–ru*. However, English and Japanese are different in terms of interpretation of the temporal morphemes in complement clauses. In what follows, I will first describe these differences by presenting how the tense morphemes locate the time of an event expressed by a verb predicate on a timeline. Next, I will introduce the predicative theory of tense proposed by Stowell (1995, 1996, 2007). On the assumption that many aspects of the semantics of tense are determined by independently motivated principles of syntactic theory (Stowell 2007: 437), this theory elucidates syntactic differences between English and Japanese with regard to the temporal interpretations. This syntactic account gives the basis of formulating hypotheses about the L2 acquisition of temporal interpretations, leading to the examination of the L2 acquisition of formal features.

1. Descriptive account

Traditionally, tenses are described by using three time points: speech (S), event (E) and reference (R) (Reichenbach 1947). In this system, interpretations of the tenses are represented by the ordering of S, E and R, as illustrated in (2):

(2) a. S, R, E　　Simple present
b. E, R – S　　Simple past
c. S, R – E　　Simple future
d. E – R – S　　Past perfect

S, R and E are simultaneous in (2a). In (2b), E and R, which are simultaneously ordered, precede S. (2c) shows that E is located after S and R, and (2d) represents that E precedes R and R precedes S.

Stowell (1996) points out that the R in the Reichenbach's system is only relevant to perfect constructions, and describes the semantics of the tense by referring to the temporal ordering of the event time (ET) and the reference time (RT). The RT corresponds to the utterance time (UT) in a simple mono-clausal sentence, and to the ET of the matrix clause in a complex sentence. In what follows, tense affixes indicating the present, past and nonpast tenses will be represented by the italicised lower case like *present, past* and *nonpast*, respectively.

In English simple sentences, the present, past and future tense morphemes determine the temporal ordering of ET and RT (i.e., UT) on the time line. Consider (3):

(3) a. John lives in Paris.
b. John lived in Paris.
c. John will live in Paris.

In (3a), the *present* locates John's state of living in Paris at a time interval including the UT. In (3b) the *past* places John's state as prior to the UT, while in (3c) the future modal *will* places it as subsequent to the UT. These observations suggest that the ET is located in relation to the UT in each sentence in (3). [(1)] This sort of interpretation is called 'indexical reading,' following Enç (1987). In Japanese, the tense morphemes in simple sentences require the indexical reading, too: the *nonpast –ru* locates the ET at or subsequent to the UT, and the *past –ta* locates the ET prior to the UT.

Now let us turn to the interpretations of the tenses in complement clauses in relation to the temporal ordering of the ET of matrix clauses and the UT. The interpretations of the *past* and the *present* under the

nonpast matrix clauses will be described, followed by those under the past matrix clauses, for English and Japanese.

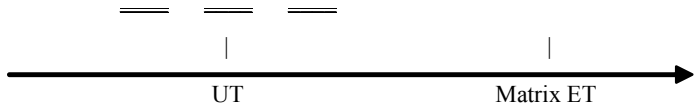
Complement clauses in English

I will first explain the interpretations of the tenses in complement clauses under the nonpast matrix clauses, shown in (4):

(4) a. John will say that Mary lived in Paris.
b. John will say that Mary lives in Paris.

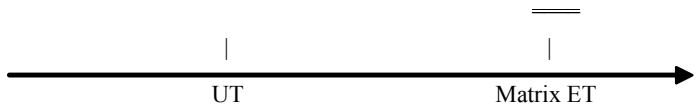
In both sentences in (4), *will* locates the matrix clause ET as subsequent to the UT. In (4a), the *past* in the complement clause locates its ET at a time prior to the matrix clause ET; that is, the state-time of Mary living in Paris precedes the event-time of John 'saying,' as illustrated in (4a').

(4a') John will say that Mary lived in Paris.



The double lines represent possible time periods for the complement clause ET. This illustrates that the ET of the complement clause can precede, follow or include the UT. This temporal interpretation is called 'shifted reading,' where the complement clause ET is determined in relation to the matrix clause ET, rather than the UT. Turning to the interpretation of the *present* in the complement clause, the complement clause ET overlaps with the matrix clause ET, as in (4b'):

(4b') John will say that Mary lives in Paris.



In this sentence, the state-time of Mary living in Paris is simultaneous with the event-time of John 'saying.' This interpretation is called 'simultaneous reading' (Enç 1987).

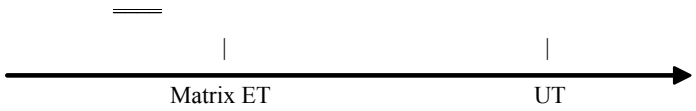
Next, the complement clause tenses under past matrix clauses will be explained. Similar to the complement clause ET under nonpast matrix clauses, that under past matrix clauses is basically interpreted in

relation to the matrix clause ET. Consider (5):

(5) a. John said that Mary left.
b. John said that Mary lived in Paris.
c. John said that Mary lives in Paris.

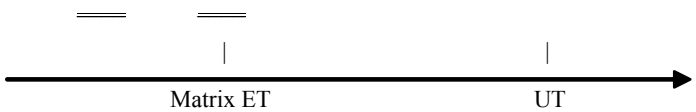
In (5a-c), the matrix clause ET is placed prior to the UT. In (5a), the *past* on the eventive predicate *leave* in the complement clause places its ET at a time prior to the matrix clause ET; namely, as illustrated in (5a'), the event-time of Mary leaving precedes that of John 'saying,' which is the shifted reading.

(5a') John said that Mary left.



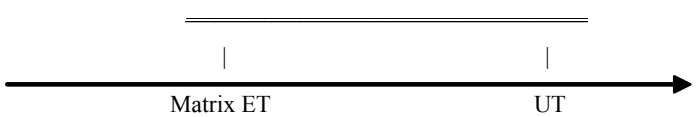
In (5b), the *past* on the non-eventive predicate *live* either locates its ET at a time prior to the matrix clause ET or overlaps with it. The former interpretation is shifted reading; the latter one is so-called 'sequence of tense (SOT)' phenomenon. They are illustrated in (5b'):

(5b') John said that Mary lived in Paris.



In (5c), the *present* in the complement clause locates its ET at a time interval which includes the matrix ET (i.e., the simultaneous reading); at the same time, the complement clause state-time includes the UT (i.e., the indexical reading).

(5c') John said that Mary lives in Paris.



As (5c') shows, the state of Mary living in Paris has to hold both at the matrix ET and the UT. This is called 'double access' reading (Stowell 1995, 1996, 2007; Ogihara 1996).

Complement clauses in Japanese

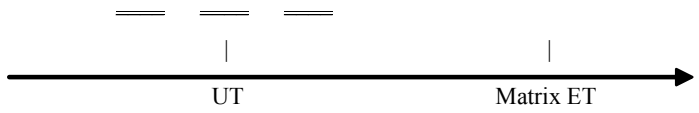
In Japanese, the complement clause tenses (i.e., the *past* and *nonpast*) locate their ET in relation to the matrix clause ET, similar to the case in English. Let me start with the interpretations of the complement clause tenses under the nonpast matrix clauses.

(6) a. John-wa [Mary-ga Pari-ni sum-te-i-ta] to iu-daro.
John-top Mary-nom Paris-loc live-te-i-past comp say-will
'John will say that Mary lived in Paris.'

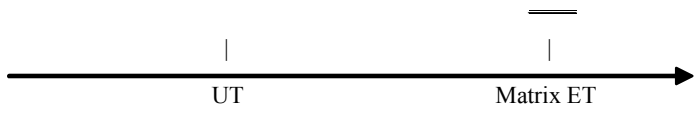
b. John-wa [Mary-ga Pari-ni sum-te-i-ru] to iu-daro.
John-top Mary-nom Paris-loc live-te-i-nonpast comp say-will
'John will say that Mary lives in Paris.'

In (6a-b), the matrix clause ET follows the UT. In (6a), the *past* in the complement clause locates its ET at a time prior to the matrix clause ET (i.e., the shifted reading). The *nonpast* in the complement clause, shown in (6b), places its ET at a time interval including the matrix clause ET (i.e., the simultaneous reading). These interpretations are illustrated in (6a') and (6b'), respectively:

(6a') John-wa [Mary-ga Pari-ni sum-te-i-ta] to iu-daro.
'John will say that Mary lived in Paris.'



(6b') John-wa [Mary-ga Pari-ni sum-te-i-ru] to iu-daro.
'John will say that Mary lives in Paris.'



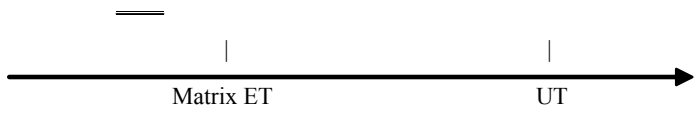
Unlike English, the complement clause tenses under the past matrix clauses are interpreted in the same way as

those under nonpast matrix clauses: the *past* requires the shifted reading and the *nonpast* requires the simultaneous reading. Take a look at the examples in (7):

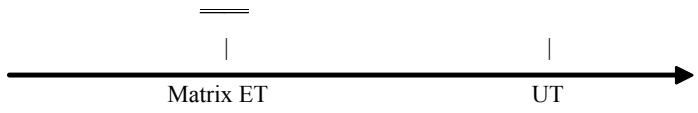
(7) a. John-wa [Mary-ga Pari-ni sum-te-i-ta] to it-ta.
John-top Mary-nom Paris-loc live-te-i-past comp say-past
'John said that Mary lived in Paris.' (Literal translation)
b. John-wa [Mary-ga Pari-ni sum-te-i-ru] to it-ta.
John-top Mary-nom Paris-loc live-te-i-nonpast comp say-past
'John said that Mary lives in Paris.' (Literal translation)

The complement clause *past* in (7a) locates its ET at a time prior to the matrix clause ET. What should be noted here is that the state-time of Mary living in Paris never overlaps with the event-time of John 'saying,' unlike English (Ogihara 1996). In other words, no SOT phenomenon exists in Japanese. In (7b), the *nonpast* in the complement clause locates its ET at a time interval including the matrix clause ET. Again, unlike English, the state-time of Mary living in Paris should not hold at the UT, suggesting that the double access reading is not required in Japanese. (7a') and (7b') illustrate these sorts of construal:

(7a') John-wa [Mary-ga Pari-ni sum-te-i-ta] to it-ta.
'John said that Mary lived in Paris.' (Literal translation)



(7b') John-wa [Mary-ga Pari-ni sum-te-i-ru] to it-ta.
'John said that Mary lives in Paris.' (Literal translation)



The interpretations of the complement clause tenses in English and Japanese are summarised in Table 1. Japanese is different from English in that Japanese does not have the sequence of tense phenomenon and the double access reading.

Table 1 Temporal interpretations of complement clauses under a past matrix clause

Language / Tense morpheme	English	Japanese
Complement past	Shifted / Simultaneous(SOT)	Shifted
Complement nonpast	Double access	Simultaneous

2. The predicative theory of tense (Stowell 2007)

In this section, Stowell's (2007) predicative theory of tense will be elaborated on. The predicative theory assumes that the properties of the semantics of tense can be determined by independently motivated principles of syntactic theory. Tense are treated as two-place predicates of temporal ordering, which take time-denoting expressions as their arguments: one argument of the tense predicate denotes the RT and the other denotes the ET expressed by the verb phrase (Zagona 1995; Stowell 1995, 1996, 2007). In what follows, I will introduce Stowell's theory with regard to a theory of argument structure providing a template for the semantics of tense, a theory of phrase structure in terms of Tense Phrase (TP), the theory of control applied to the temporal interpretation and a theory of temporal polarity, so as to account for temporal interpretations in English and Japanese. In addition to the italicised lower case terms *tense, present, nonpast* and *past* to refer to tense affixes, which have been used so far, I will use the upper case terms TENSE, PAST and PRESENT to refer to the semantic content of tense.

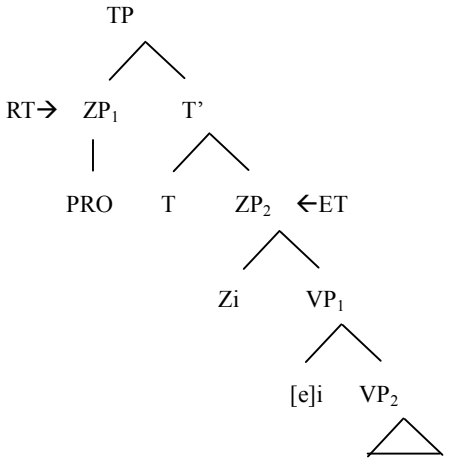
Tense as a two-place predicate

It is proposed that tenses are two-place predicates, taking time-denoting expressions as their arguments. The internal argument is a time-denoting expression containing a verb phrase, which denotes the ET, while the external argument denotes the RT. The tense determines a relative temporal ordering of the ET and the RT. For instance, the *past* locates the ET prior to the RT, which corresponds to the UT in a simple mono-clausal sentence, yielding the interpretation that the ET precedes the UT.

The syntactic category Z and phrase structure

Stowell proposes a phrase structure in terms of a syntactic category Time Phrase (TP). In TP, the temporal arguments of T are encoded; namely, the covert RT argument syntactically occurs in the Specifier position of TP, and the ET argument syntactically occurs as the complement of T. He also proposes a category Zeit Phrase (ZP) occurring in the Spec and in the complement position of TP.[(2)] It is headed by Z, and it takes Verb Phrase (VP) or its extended projection such as an aspectual category as its complement. These categories are illustrated in (8):

(8)



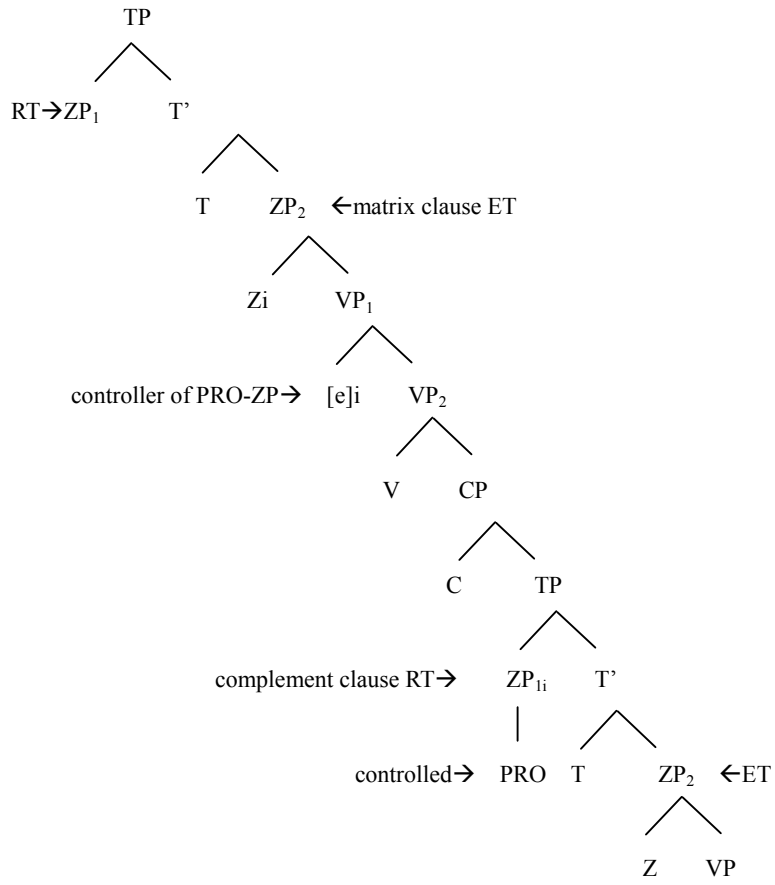
(Following Stowell 2007: 446)

The covert RT argument is comparable to PRO, and the overt ET argument is encoded in ZP_2. VP_1 is the restricting clause of Z. The head of ZP_2, Z, is an operator which binds a variable e existing in the VP-internal temporal argument position.

Temporal control

The theory of control, which has been used regarding PRO-DP, plays an important role in Stowell's theory to account for how the reference point of the temporal ordering predicate is determined. As the PRO-DP subject of a complement clause is controlled, or bound, by the closest c-commanding DP argument of the main clause predicate selecting that complement clause, a controller or an antecedent of the covert RT argument of T is the closest c-commanding temporal argument. Consider the phrase structure for a complex sentence illustrated in (9):

(9)



(Following Stowell 2007: 446)

The complement clause RT is encoded in its ZP_1. PRO-ZP of the complement clause has to be controlled by the closest c-commanding temporal argument. Spec of the matrix clause VP_1 c-commands the complement clause, so the variable in the position is the controller of the complement clause PRO-ZP.[(3)] Recall that the complement clause ET is always determined in relation to the RT, which is the matrix clause ET. This is the outcome of the temporal control where the complement clause RT is bound by the closest c-commanding temporal argument, which is the variable in the Spec of the matrix clause VP_1, or the matrix clause ET.

Temporal polarity

Stowell (1995, 1996, 2007) further proposes the theory of temporal polarity. The *past* and the *present* are treated as a kind of polarity item, such as the quantificational determiners *any* and *some*. They are different from each other in terms of their scopal properties: *any* must exist at LF under the scope of Negation, whereas

some must exist outside of it. The temporal polarity requirement is given in (10):

(10) Morphological *past* is a PAST Polarity Item (PPI); the ZP that it heads must fall under the scope of a (covert) true PAST tense. Morphological *present* is a PAST "anti-polarity" item (PAI); the ZP that it heads must not fall under the scope of any (covert) true PAST tense. (Stowell 2007: 452)

It follows that the existence of morphological *past* in Z requires a covert PAST to exist in T to license it, but the *past* does not express the semantic PAST by itself. Similarly, a covert PRESENT is required to exist in T to license the morphological *present* in Z, but the *present* does not express PRESENT. It should be noted that the covert TENSES (i.e., PAST and PRESENT), instead of the morphological tenses (i.e., the *past* and *present*), express the temporal ordering predicates that denote past-shifting and simultaneity, respectively. Now we are ready to understand how the SOT phenomenon and the double access reading can be explained in a consistent manner.

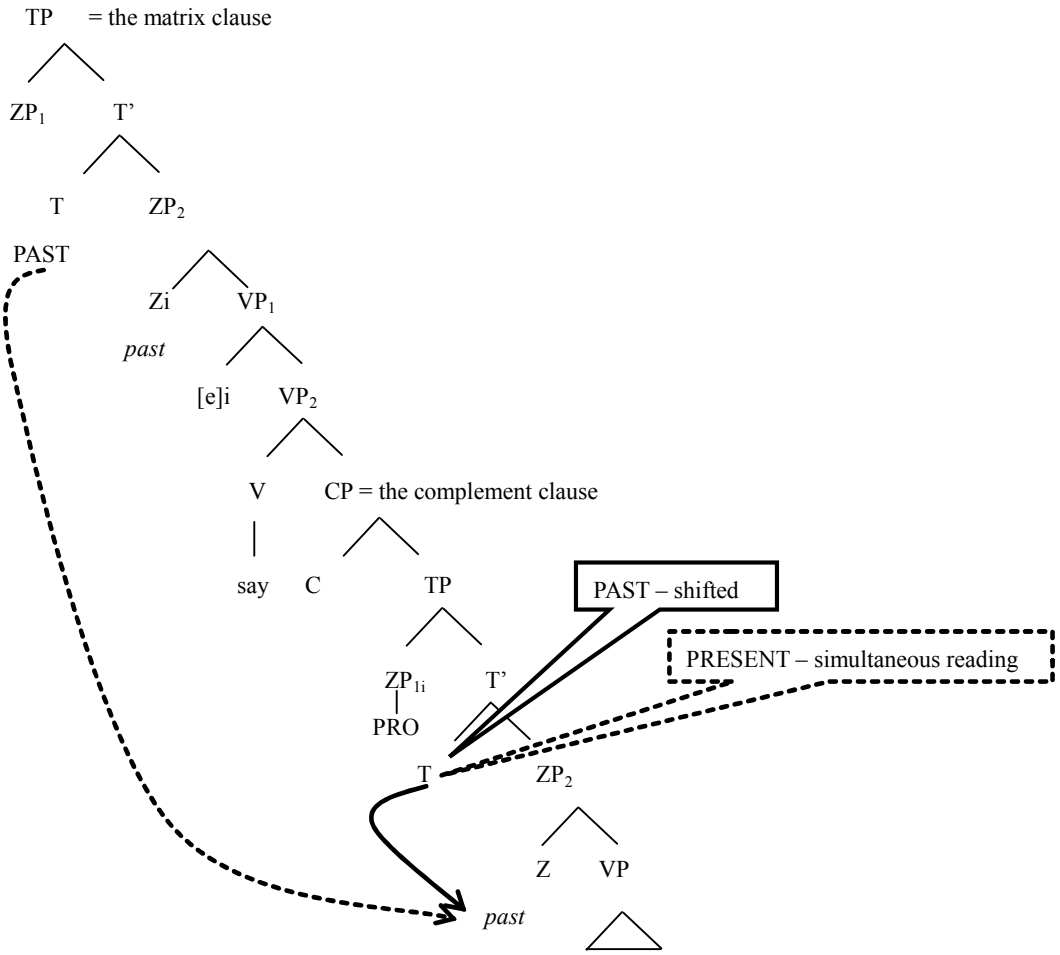
The SOT phenomenon

Recall that the complement clause *past* under the past matrix clause gives rise to the simultaneous reading in English, as shown in (5b), repeated in (11):

(11=5b) John said that Mary lived in Paris.

The state-time of Mary living in Paris overlaps with the event-time of John 'saying.' This suggests that the complement clause TENSE expresses simultaneity, indicating that PRESENT exists in the T head, which c-commands the past in the Z head of ZP_2. This seems to contradict the temporal polarity requirement in (10), because the *past* falls under the scope of PRESENT. To solve this problem, Stowell assumes two possible licensing conditions: local and non-local licensing. Look at the phrase structure in (12):

(12)



(Following Stowell 2007: 453)

The morphological past must fall under the scope of the covert PAST to be licensed. In English, it is assumed that the Past Polarity Item (PPI) *past* does not have to fall under the scope of a clause-mate PAST: the complement clause *past* can be licensed by PAST of either the complement clause (i.e., the local licensing) or the matrix clause (i.e., non-local licensing). In the case of the local licensing, as represented by the solid line in (12), the *past* must be under the scope of PAST, so the covert TENSE must be PAST. This yields the shifted reading. On the other hand, in the case of the non-local licensing, as demonstrated by the dotted line, the *past* is licensed by the matrix clause PAST. Thus, the covert TENSE in the complement clause does not have to be PAST; it can be PRESENT, giving rise to the simultaneous reading.

In Japanese, the complement clause *past* under the matrix clause *past* yields only shifted reading, suggesting that the TESNE in the complement clause is PAST. According to Nakamura (1995) and Kusumoto

(1999), cited in Stowell (2007), the assumption that the morphological *past* is always licensed by the clause-mate PAST (i.e., the local licensing) in Japanese accounts for the absence of the SOT phenomenon.

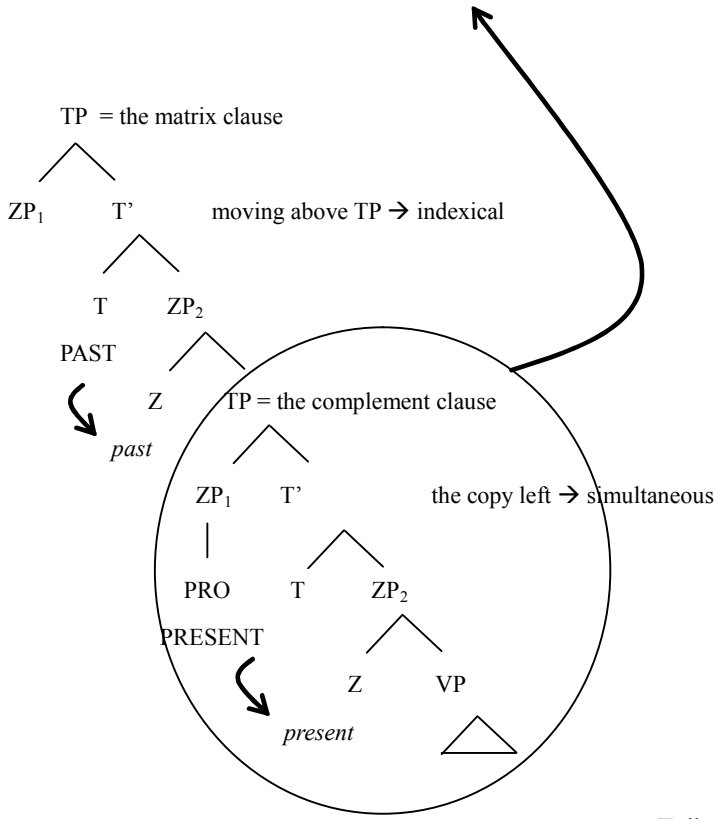
The double access reading

Remember that the morphological present in the complement clause under the matrix clause *past* requires the double access reading: the simultaneous and the indexical readings hold at the same time. See the example in (5c), repeated in (13):

(13=5c) John said that Mary lives in Paris.

The state-time of Mary living in Paris must include the event-time of John 'saying' (i.e., the matrix clause ET) and the UT. The availability of the non-local licensing in English and the copy theory of movement which has developed within the Minimalist Program (Chomsky 1995) explains how the double access reading is yielded. Take a look at the figure in (14), where functional categories irrelevant to this explanation are omitted.

(14)



(Following Stowell 2007: 453)

The temporal polarity requirement in (10) tells us that for the morphological *present* (i.e., PAST 'anti-polarity' item, PAI), to be licensed, it must fall under the scope of PRESENT. If the non-local licensing is possible with the PAI as well as the PPI, the complement clause *present* is under the scope of the matrix clause PAST and the complement clause PRESENT at the same time, as illustrated in (14). To avoid violation of the temporal polarity requirement, the complement clause must scope out and move above TP of the matrix clause at LF. Since the RT of the moved complement clause is the UT, the indexical reading is yielded. Furthermore, a copy of the moved clause is left behind, resulting in the simultaneous reading. In this way, the *present* under the matrix clause *past* gives rise to the double access interpretation without violating the temporal polarity requirement.

In Japanese, the *present* under the matrix clause *past* does not require the double access reading; that is, the indexical reading is not obligatory. Given that the PAI, as well as the PPI, is locally licensed in Japanese, the *present* is licensed by only the clause-mate PRESENT, which yields the simultaneous reading. In this case the temporal polarity requirement is not violated, so the complement clause does not have to scope out.

English and Japanese are different with regard to the interpretations of the *past* and the *present* under the matrix clause *past*: English requires the sequence of tense (SOT) phenomenon and the double access reading, but Japanese does not. This difference can be accounted for by the Stowell's predicative theory of tense. In English the morphological *present* and *past* in the complement clause can be licensed by either the complement clause TENSE or the matrix clause TENSE; in other words, the difference between the two languages arises from the syntactic constraint on the licensing condition.

III. The Study

1. Hypotheses

The empirical study of the present article examines Japanese speakers' temporal interpretation of the complement clause in English, to test the Feature Reassembly Hypothesis. Specifically, I will investigate whether the difficulty of L2 acquisition in the morpho-syntactic domain is determined by how complicated reconfiguration of formal features on L2 morphological items is. To answer this question, the following two hypotheses are addressed.

(i) With regard to the interpretation of the past tense morpheme in complement clauses embedded under matrix clauses that contain the past tense morpheme, eventive predicates are interpreted more easily than stative ones.

The differences between the English and Japanese temporal interpretations are attributed to locality condition

on the licensing of a PPI (i.e., morphological *past*) and a PAI (i.e., morphological *present*): the English PPI and PAI are licensed either locally or non-locally, whereas the Japanese ones are licensed locally. I assume that this condition is determined by a formal feature [+/- local] assigned to each tense morpheme. I further assume that regarding the English past morpheme, its feature value depends on a type of predicates to which it attaches; namely, [+local] is assigned to eventive predicates while [-local] is assigned to stative ones. In Japanese, by contrast, [+local] is assigned to predicates across the board. Given these assumptions about the cross-linguistic differences, Japanese speakers' learning tasks are to create a new association of [+/- local] with the tense morphemes and predicate types. Specifically, the Japanese speakers have to newly associate [-local] with stative predicates, but they do not have to do it with eventive ones. Thus, I hypothesise that if the Feature Reassembly Hypothesis is correct, the interpretation of the past tense morpheme involving stative predicates will be more problematic than that involving eventive predicates.

(ii) In complement clauses embedded under matrix clauses that contain the past tense morpheme, the interpretation of the present tense morpheme is acquired more easily than that of the past tense morpheme.

In order to correctly interpret the present tense morpheme under the past matrix clause, Japanese speakers have to newly associate [-local] with the present tense morpheme. This time, predicate types do not have to be taken into consideration. This indicates that the feature reassembly is less complicated for the interpretation of the present tense morpheme than for that of the past morpheme. Therefore, I hypothesise that the interpretation of the past tense morpheme will be more problematic than that of the present tense morpheme.

2. Method

Participants

Forty-six Japanese-speaking learners of English participated in this study. They can be regarded as adult learners because all of them had started learning English in classroom settings at the age of around 12. Seven native speakers of English also participated in the study as a control group.

The Japanese-speaking learners were divided into Elementary, Lower Intermediate, Upper intermediate and Advanced groups, based on their scores of the Quick Placement Test. Table 2 presents results of the proficiency test. A one-way ANOVA on the scores of the test revealed a significant difference between groups ($F(3,42)=121.27$, $p<.001$). Ryan's method showed significant differences among all the groups at 5% level, suggesting that the learner groups are different from each other in terms of their proficiency levels.

Table 2 Results of the English proficiency test

Proficiency Level	N	Mean Score	SD	Range
Elementary	6	22.33	3.27	19-27
Lower Intermediate	15	35.47	3.00	30-39
Upper Intermediate	17	42.71	2.11	40-47
Advanced	8	52.63	4.44	48-60
Total	46	39.54	9.13	19-60

Materials

Participants were asked to complete Sentence-Story Compatibility Test. This was a written judgment test aimed at examining participants' interpretations of temporal morphology in complement clauses. Specifically, this test elicited the L2 learners' knowledge of the SOT phenomenon and the double access reading.

Participants were required to rate the compatibility of a short story with a sentence referring to it. Each test item was comprised of a story, a test sentence and a five-point scale. Participants read the story and judged on the scale the level of compatibility of the test sentence with the preceding story (from 1 representing 'definitely not compatible', to 5 representing 'definitely compatible').

The test consisted of 20 target items (12 past + past and eight past + present constructions) and two distractors. Examples of the target items for the past + past construction with a stative predicates, that with an eventive-predicate and the past + present construction are given in (15), (16) and (17), respectively.

(15) The past + past construction with a stative predicate (SOT)

a. I talked to John on March 10. According to him, his wife was sick before March 10.
But she was not sick on March 10. *Shifted context*
John said that his wife was sick. (Compatible)

b. I talked to John on March 10. According to him, his wife was sick on March 10.
Simultaneous context
John said that his wife was sick. (Compatible)

The test had eight test items examining the knowledge of the SOT phenomenon. In (15) the target sentence is *John said that his wife was sick*. The past state in the complement clause (i.e., his wife being sick) gives rise to the simultaneous (i.e., SOT) as well as the shifted reading. Therefore, the target sentence is compatible with the context in both (15a) and (15b). The other four items with eventive predicates do not require the SOT.

(16) The past + past construction with an eventive predicate (No SOT)

a. Jack's wife cooked soup for dinner. The soup was ready at 7.30. Jack arrived home and talked about dinner with his wife at 8.00. *Shifted context*

Jack's wife said that she cooked soup. (Compatible)

b. At 8.00 Jack's wife cooked soup for dinner. Jack arrived home and talked about dinner with his wife at 8.00. *Simultaneous context*

Jack's wife said that she cooked soup. (Incompatible)

The past event in the complement clause (i.e., her cooking soup) requires the shifted reading, so the target sentence *John's wife said that she cooked soup* is compatible with the context in (16a) but incompatible with the one in (16b). Examples of the past + present construction is given in (17):

(17) The past + present construction (Double access)

a. I talked to Amy in September 2007. According to her, she ran 5 kilometers every day in September 2007. But she does not run 5 kilometers every day now. *Simultaneous-only context*

Amy said that she runs 5 kilometers every day. (Incompatible)

b. I talked to Amy in September 2007. According to her, she ran 5 kilometers every day in September 2007. And she still runs 5 kilometers every day now. *Double access context*

Amy said that she runs 5 kilometers every day. (Compatible)

The present tense morpheme in the target sentence *Amy said that she runs 5 kilometers every day* requires the double access reading, so it is compatible with the context in (17b), where a habitual situation in the complement clause (i.e., running 5 kilomerters every day) holds at the matrix clause ET (i.e., September 2007) and the UT. Two sets of questionnaire with different orders of test items were created to counterbalance possible effects of the item order. All the test items are given in Appendix.

3. Results

The past + past construction

The participants' responses to the past + past construction revealed their knowledge of the SOT phenomenon. Table 3, Figure 1 and Figure 2 show mean ratings on test sentences involving the interpretation of the past tense morpheme in a complement clause under a past matrix clause by predicate type and context.

Table 3 Mean ratings on the past + past construction

Predicate type	Stative		Eventive	
Context	Shifted	Simultaneous	Shifted	#Simultaneous
Elementary (n=6)				
Mean	3.75	4.00	3.50	2.42
(SD)	(0.69)	(0.78)	(0.91)	(1.30)
Lower intermediate (n=15)				
Mean	3.08	3.98	3.60	3.43
(SD)	(0.98)	(0.73)	(1.14)	(0.96)
Upper intermediate (n=17)				
Mean	3.44	4.31	3.47	3.71
(SD)	(0.82)	(0.44)	(0.72)	(0.77)
Advanced (n=8)				
Mean	3.69	4.44	4.31	3.00
(SD)	(1.22)	(0.62)	(0.83)	(1.00)
Native control (n=7)				
Mean	3.39	4.50	3.71	3.50
(SD)	(0.69)	(0.52)	(1.25)	(1.20)

Note. # = incompatible, SD = standard deviation

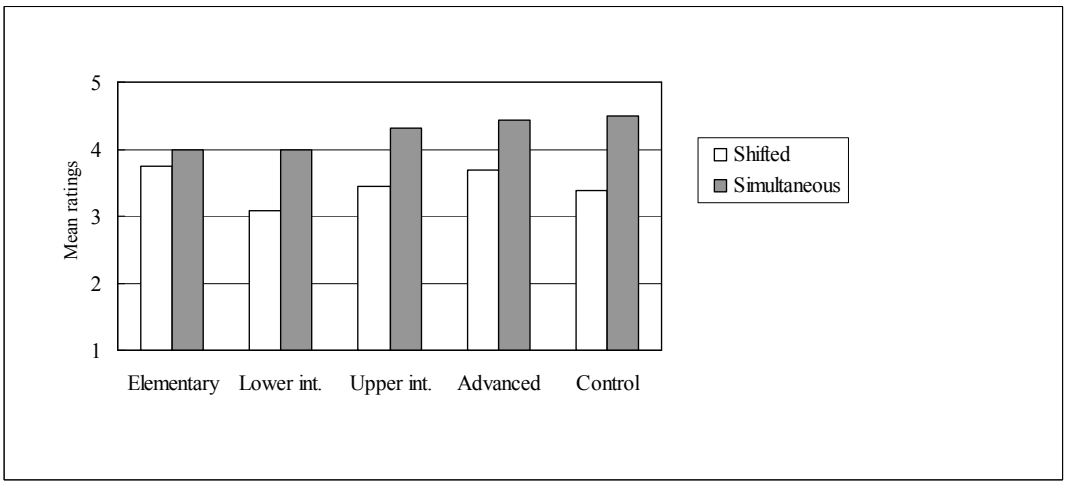


Figure 1 Mean ratings on the past + past construction (Stavies)

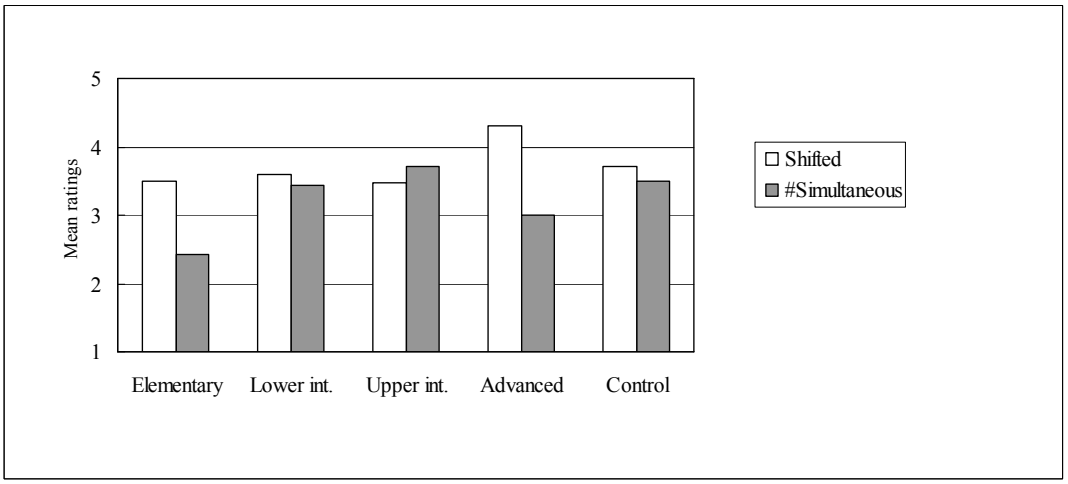


Figure 2　Mean ratings on the past + past construction (Eventives)

A mixed design factorial ANOVA was performed to analyse the ratings. The between-subject factor was proficiency level, and the within-subject factors were predicate type (i.e., stative and eventive) and context (i.e., shifted and simultaneous). A main effect of predicate type was significant ($F(1,4)=14.89$, $p<.001$). There were no significant main effect of proficiency level ($F(4,48)=0.78$, $p<1$) and no significant main effect of context ($F(1,48)=0.98$, $p<.50$).

There was a significant interaction between predicate type and context ($F(1,48)=29.48$, $p<.001$). To see whether or not learners distinguished ratings between shifted and simultaneous contexts, let us focus on the effect of context. Analyses of simple main effects indicated that the effects of context were significant for both stative and eventive predicates ($F(1,96)=18.74$, $p<.001$; $F(1,96)=8.06$, $p<.01$; respectively). This suggests that the learners at every proficiency level distinguished the simultaneous from the shifted context for the stative and eventive predicates.

Concerning the stative predicates, it was predicted that shifted and simultaneous contexts would be accepted to a similar degree since both interpretations were possible. However, the simultaneous reading was preferred to the shifted one by all the groups. What should be noted here, nevertheless, is that the Japanese-speaking learners did not rate the simultaneous reading lower than the shifted one despite the fact that the simultaneous reading is not allowed in their L1. Therefore, I claim that the L2 learners were successful in learning the SOT phenomenon, indicating that they newly associated [-local] with the past tense morpheme and the stative predicates.

With regard to the eventive predicates, it was predicted that shifted contexts would be more highly rated than simultaneous contexts because only the shifted reading is allowed. The ANOVA revealed that the

learners correctly distinguished the two contexts. Again, the learners were successful in associating [+local] with the past tense morpheme and the eventive predicates.

The past + present construction

The Japanese learners' knowledge of the double access reading was investigated by testing their interpretation of the present tense morpheme in a complement clause under a past matrix clause. Mean ratings on test sentences are given in Table 4 and Figure 3.

Table 4 Mean ratings on the past + present construction

Context	#Simultaneous only	Double access
Elementary (n=6)		
Mean	3.33	4.13
(SD)	(0.67)	(0.52)
Lower intermediate (n=15)		
Mean	2.97	4.08
(SD)	(0.98)	(0.54)
Upper intermediate (n=17)		
Mean	2.24	4.29
(SD)	(0.85)	(0.76)
Advanced (n=8)		
Mean	1.97	4.41
(SD)	(1.16)	(0.97)
Native control (n=7)		
Mean	3.07	4.61
(SD)	(1.13)	(0.68)

Note. # = incompatible, SD = standard deviation

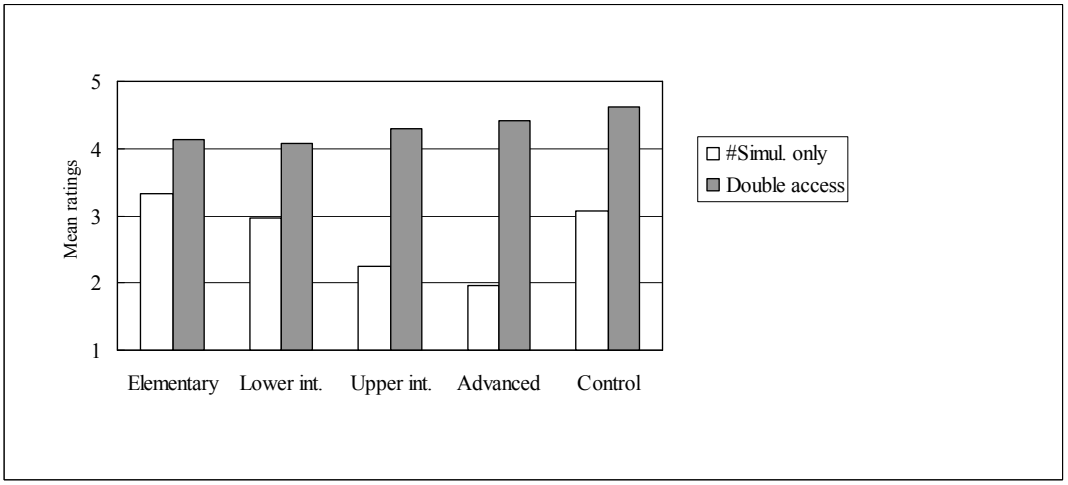


Figure 3　Mean ratings on the past + present construction

The ratings were analysed by performing a mixed design factoral ANOVA, in which the between-subject factor was proficiency level, and the within-subject factor was context (i.e., simultaneous-only and double access). A significant main effect of context was found ($F(1,48)=72.30$, $p<.001$). A main effect of proficiency level was not significant ($F(4,48)=1.81$, $p<.50$).

There was a significant interaction between proficiency level and context ($F(4,48)=2.58$, $p<.05$). I further analysed this interaction and found that the simple main effect of context was marginally significant for the elementary group ($F(1,48)=3.59$, $p<.10$), and significant for all the other groups: $F(1,48)=7.15$, $p<.05$ for the lower intermediate; $F(1,48)=24.30$, $p<.001$ for the upper intermediate; $F(1,48)=34.06$, $p<.001$ for the advanced group. This means that all but the elementary group rated the test sentences in the double access context significantly more highly than those in the simultaneous-only context. Therefore, I argue that the learners were successful in associating [-local] with the present tense morpheme.

IV. Discussion and Conclusion

Let us consider the two hypotheses that I have formulated. Firstly, I hypothesised that in the past + past construction, the interpretation of the past tense morpheme on stative predicates is more problematic that that on eventive ones because the former requires Japanese speakers to deal with a feature value which is absent in their L1. This hypothesis was not supported. The finding that the learners successfully learnt the SOT phenomenon on stative predicates indicates that they were successful in associating [-local] with the past tense morpheme and stative predicates, even though [-local] is never assigned in their L1. Furthermore, with regard to eventive predicates, the learners gave significantly higher ratings to the shifted reading than the simultaneous

one, suggesting that the learners successfully associated [+local], which exists in Japanese, with the past tense morpheme and eventive predicates. Since the temporal interpretations of stative and eventive predicates were equally learnt by the Japanese speakers, I argue that degree of complexity in feature reassembly cannot be a determining factor for learnability.

Secondly, the hypothesis that under past matrix clauses, the interpretation the present tense morpheme is easier than that of the past tense morpheme because the latter involves more complex feature reconfiguration: [-local] is assigned to stative predicates and [+local] to eventive ones. This hypothesis was also rejected. The results revealed that both tense morphemes were correctly interpreted all in all. To be precise, the double access reading of the present tense morpheme seemed a little more difficult than the interpretation of the past tense morpheme. The double access reading was not clearly favoured by the elementary group, suggesting that this group was still unsuccessful in assigning [-local] to the English present tense morpheme. By contrast, concerning the interpretation of the past tense morphemes, there were no significant differences in performances among groups, and all the groups gave the correct interpretations. This reveals that the L2 learners can overcome the difficulty in reconfiguring features like [+/- local] in relation to predicate types involved. Therefore, we cannot say that difficulty of feature reassembly necessarily explains difficulty of L2 acquisition.

In conclusion, we cannot clearly say that acquisition difficulty will increase with the complexity of feature reassembly. If the degree of complexity of feature reassembly is not a determining factor for learnability, what accounts for the learnability? As White (2009) points out, Lardiere has not touched on the difficulty in learning L2 features which are not selected in L1. Yamazaki-Hasegawa (2013) examined L2 acquisition of aspectual and temporal interpretations and proposes that learning a feature which is not selected in L1 is hard. She further argues that unlearning a feature which was previously selected and associated with an L1 lexical item is extremely difficult. I suppose that it is worth investigating the source of learnability problems by considering whether a feature is instantiated in the learners' L1 in future research.

Notes

(1) The term ET includes both event-time and state-time.

(2) *Zeit* is a German word which means *time*.

(3) To be precise, not the matrix clause ET but the variable in the Spec of the matrix clause VP_1 c-commands the RT argument of the complement clause. For simplicity, however, Stowell uses 'the matrix ET' as a term referring to either the denotation of the main clause ZP_2 or the variable in the Spec of the matrix clause VP_1.

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Appendix

The Sentence-Story Compatibility Test item list

The past + past construction (a: shifted, b: simultaneous)

Statives

1. I talked to John on March 10.

a. According to him, his wife was sick before March 10. But she was not sick on March 10.

b. According to him, his wife was sick on March 10.

John said that his wife was sick. (1a:Native English Grammar 5/ 1b:5)

2. I talked to Mike at 9:00.

a. According to him, he had a fever of 38 degrees before 9:00. But he did not have a fever of 38 degrees at 9:00.

b. According to him, he had a fever of 38 degrees at 9:00.

Mike said that he had a fever of 38 degrees. (2a:5/ 2b:5)

3. I talked to Mr Cox in September 2007.

a. According to him, he owned a winery in France in January 2007. But he did not own it any more in September 2007.

b. According to him, he owned a winery in France in September 2007.

Mr Cox said that he was running a winery in France. (3a:5/ 3b:5)

4. I talked to Amy in December 2007.

a. According to her, she ran 5 kilometers every day before December 2007. But she did not run any more in December 2007.

b. According to her, she ran 5 kilometers every day in December 2007.

Amy said that she ran 5 kilometers every day. (4a:5/ 4b:5)

Eventives

5.

a. Jack's wife cooked soup for dinner. The soup was ready at 7:30. Jack arrived home and talked about dinner with his wife at 8:00.

b. At 8:00 Jack's wife was cooking soup for dinner. Jack arrived home and talked about dinner with his wife at 8:00.

Jack's wife said that she cooked soup. (5a:5/ 5b:1)

6.

a. Mary returned home and talked to her daughter at 2:00. According to her daughter, she played the piano from 12:00 to 1:00.

b. At 2:00 Mary's daughter was playing the piano at home. At 2:00 Mary returned home and heard the sound of the piano.

Mary learned that her daughter practiced the piano. (6a:5/ 6b:1)

The past + present construction (a: simultaneous only, b: double access)

7. I talked to Mr Cox in September 2007.

a. According to him, he owned a winery in France in September 2007. But he does not own it now.

b. According to him, he owned a winery in France in September 2007. And he still owns it now.

Mr Cox said that he is running a winery in France. (7a:1/ 7b:5)

8. I talked to Amy in September 2007.

a. According to her, she ran 5 kilometers every day in September 2007. But she does not run 5 kilometers every day now.

b. According to her, she ran 5 kilometers every day in September 2007. And she still runs 5 kilometers every day now.

Amy said that she runs 5 kilometers every day. (8a:1/ 8b:5)

9. When I talked to Mrs Black a year ago, she was worried about her daughter. Her daughter weighed only 40 kilograms then.

a. But now she does not weigh 40 kilograms.

b. And she still weighs 40 kilograms now.

Mrs Black was worried that her daughter weighs only 40 kilograms. (9a:1/ 9b:5)

10. When I visited Mr White in Edinburgh five years ago, he told me about a nice restaurant in front of the station.

a. But the restaurant is not there now.

b. And the restaurant is still there now.

Mr White said that there is a nice restaurant in front of the station. (10a:1/ 10b:5)